

CLAIMS

What is claimed is:

1. A signal generation power management control system for use in a portable communications device comprising:
 - a digital signal processor (DSP) for processing a digital source input and providing a digital processed bit stream;
 - a digital-to-analog converter (DAC) for converting the digital processed bit stream and providing at least one analog signal; and
 - 10 a power management controller within the DSP for interpreting a plurality of control parameters and dynamically adjusting a bias current used by the DAC based on minimal signal requirements of the at least one analog signal.
- 15 2. A signal generation power management control system as in claim 1, wherein the control parameters include a digital multiple access protocol (MA), noise requirements, intermodulation distortion (IMD) requirements and reference capacitance requirements for a predetermined slew rate.
- 20 3. A signal generation power management control system as in claim 1, further comprising:
 - at least one DAC filter for adjusting the at least one analog signal to a desired frequency response.
- 25 4. A signal generation power management control system as in claim 3, further comprising:
 - a mixer for providing an intermediate frequency (IF) signal from the at least one analog signal; and
 - 30 a power amplifier for amplifying the IF signal from the mixer.

5 5. A signal generation power management control system as in claim 4, wherein the bias current of the DAC filter, mixer and power amplifier can be dynamically controlled by the power management controller in order to minimize current drain of a portable communications device.

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6. A signal generation power management control system as in claim 4, wherein the IF signal operates at radio frequency (RF).

10 7. A power management control system for use with signal generation components in a portable communications device comprising:
 a digital signal processor (DSP) for processing a digital bit stream and providing a processed digital signal therefrom;
 a digital-to-analog converter (DAC) for converting the processed digital signal and providing a modulated analog signal;
 15 at least one DAC filter for controlling the frequency response of the modulated analog signal to produce a filtered signal;
 a mixer for mixing the filter signal with at least one local oscillator signal to produce an intermediate frequency (IF) signal;
 a power amplifier for amplifying the IF signal; and
 20 a power management controller located within the DSP for adjusting the control parameters of the DAC, at least one DAC filter, mixer and power amplifier based upon digital protocol received by the DSP and minimum analog signal requirements specified by the portable communications device.

25 8. A power management control system as in claim 7, wherein the control parameters include adjusting supply bias based upon determination of the digital multiple access protocol (MA), system noise requirements, intermodulation distortion (IMD) requirements, and reference capacitance requirements for achieving a predetermined slew rate.

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9. A power management control system as in claim 7, wherein control parameters for the DAC, the at least one DAC filter, mixer and power amplifier may be independently controlled.

5 10. A power management control system as in claim 7, wherein the power management controller further controls supply bias to an audio processing system in a receiver of the portable communications device.

10 11. A method for managing power to a communications system having at least one digital-to-analog converter (DAC) comprising the steps of initializing the components used within a portable communications system;

15 receiving an incoming digital input stream at a digital signal processor (DSP);
determining the digital multiple access protocol (MA) used in the digital input stream;
generating a processed digital signal from the DSP;
converting the processed digital signal to an analog signal using a DAC; and

20 controlling a supply bias used by the DAC based upon the MA, noise requirements and intermodulation requirements of the portable communications system.

25 12. A method for managing power to a communications system utilizing a DAC as in claim 11, wherein the supply bias is controlled by a power management controller in the DSP.

30 13. A method for managing power to a communications system utilizing a DAC as in claim 12, wherein the power management controller can adjust a reference capacitance in the DAC for controlling slew rate.

14. A method for managing power to a communications system utilizing a DAC as in claim 13, wherein the reference capacitance controls noise and slew rate.

5 15. A method for managing power to a communications system utilizing a DAC as in claim 11, wherein the DAC is in an audio processing system.